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Cover Crop Adoption Decisions in Iowa: Insights from an In-Person Survey

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CURRENT NITROGEN and phosphorus applications in the Midwest have been connected to increasing water quality problems. In an effort to improve water quality, the Iowa Nutrient Reduction Strategy (INRS), a science and technology-based framework to assess and decrease nutrients to Iowa water and the Gulf of Mexico, was developed in 2013 (INRS 2013). This framework advocates significant voluntary adoption of cover crops, which are planted between harvest and the planting of cash crops. While cover crops were utilized in the past to decrease soil erosion and build up soil organic matter, this technology has been revived recently due to its multi-functionality. Cover crops are very promising as they can reduce both nitrogen and phosphorus losses by around 30 percent (INRS 2013). The INRS proposes several scenarios to meet the N and P reduction goals including two in which row crop land cover crop adoption rates are proposed. Some Eastern states have recognized the importance of this practice such as Indiana, where 7.1 percent of farmland planted cover crops (Rundquist and Carlson 2017).

Despite cover crops' potential, this conservation practice has been adopted on a very small number of acres in Iowa. In 2013, there were just 300,000 cover crop acres planted in Iowa (Soil and Water Conservation Society 2015). This number is miniscule relative to the total number of corn and soybean acres—around 23 million. Nevertheless, the number of cover crop acres has



Photo credit: Edwin Rensberg; USDA-SARE program

doubled in two years. In 2015, there were around 592,000 cover crops acres in Iowa, accounting for 2.6 percent of its farmland (Rundquist and Carlson 2017). These adoption statistics show that substantial efforts will be needed in order to increase voluntary adoption and to reach adoption rates suggested by the INRS.

Given the potential of cover crops, a better understanding of farmers' adoption decisions, incentives, and conservation barriers becomes necessary to effectively promote this conservation technology. We obtain a first glance on these items through an in-person survey, funded through the Iowa Nutrient Research Center, given to 38 farmers from three Water Quality Initiative priority watersheds and from one non-priority watershed in Iowa. The latter had an active farmer-

led watershed group from which interviewees were sampled. Among respondents, 25 used cover crops, 12 were familiar with cover crops, but did not use the practice, and only one farmer was not familiar with cover crops. Thus, this small sample offers insights on farmers who are familiar with this promising technology. Among cover crops users, there was an average of 235 cover crops acres planted on both rented and owned land. Users reported cover crops on 140 owned acres relative to on 96 rented acres, illustrating different behavior between the two types of land.

To understand farmers' adoption decisions and incentives, the survey asked about the costs associated with this practice. Among users, the cost was roughly \$28 per acre, while the cost was \$25 among nonusers. Given

the voluntary nature of this practice, several farmers expect an incentive payment for establishing cover crops. The Environmental Quality Initiative Program (EQIP) offers payment rates that vary from \$24 to \$35 per cover crop acre, depending on the seed type (USDA-NRCS 2013). In 2013, the Water Quality Initiative offered \$25 per acre (Swobdoba 2013). Farmers were asked: (a) "How much would a payment per acre have to be in order for you to try cover crops?" and, (b) "How much would a payment per acre have to be in order for you to adopt cover crops on your farm?" Seven farmers did not respond to either question, and two farmers did not know. For the first question, three farmers answered 50 percent cost per acre, three answered zero, and two indicated that they tried on their own before incentives were in place. Among numeric responses, the averages were around \$28 and \$31 for each question respectively. These values are close to the cost reported by users. Among farmers who responded to both questions, 22 farmers provided the same answer, while 9 farmers responded differently.

Besides costs and incentive payments, farmers consider yield changes in their adoption decisions. Focusing on cover crop users, yield stayed the same among 12 farmers. Two farmers experienced a decrease in yield, while five farmers had an increase. Lastly, five users did not know whether the yield changed. Farmers were also asked about the risks, benefits,

and barriers associated with planting cover crops. Twenty-five farmers mentioned termination as a major risk associated with this practice. They appear concerned with its timing and process, which can affect the planting and subsequent growing of the cash crop in the spring. In fact, five farmers expressed their apprehension regarding the delay in spring planting. In addition, 9 farmers listed yield loss as a major risk associated with cover crops. Switching to benefits, 25 farmers mentioned improvements in reducing soil erosion, 8 farmers stated improvements in soil health or soil quality, and 14 farmers listed the increase in organic matter as major benefits associated with cover crops. Only three farmers listed water quality improvements as a benefit of cover crops.

When asked about barriers that prevent farmers from adopting cover crops, 19 farmers pointed to cost barriers. Regarding management barriers, 20 farmers said that the timing to plant cover crops is a major obstacle to establish this practice, since there is a short planting window and the growing season is very short. Eight farmers pointed to the additional time and labor required, and five farmers identified problems associated with terminating the cover crop as a barrier. These barriers are clearly connected to their perceived risks. Five farmers documented the lack of immediate benefits as something preventing farmers from adopting this practice. Lastly, eight farmers commented on

the uncertainty associated with this practice or the lack of willingness to try to new methods as potential explanations for the lack of adoption.

This small survey provides a first glance at adoption decisions and barriers of farmers who are familiar with cover crops. More research is needed to identify the right incentives that will spread this promising technology in Iowa. ■

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